PATENT
514413-3852

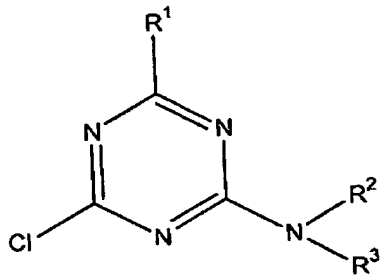
AMENDMENTS TO THE CLAIMS

Please amend the claims without prejudice, without admission, without surrender of subject matter, and without any intention of creating any estoppel as to equivalents, as follows.

In the Claims:

Claim 1 (currently amended)

1. A process for the preparation of compounds of the formula (I) or salts thereof



(I)

in which

R^1 is $(C_1\text{-}C_8)$alkyl or $(C_3\text{-}C_8)$cycloalkyl, ~~where each of the two above radicals independently of one another is unsubstituted or unsubstituted~~ which is independently of one another unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, cyano, nitro, thiocyanato, formyl, $(C_1\text{-}C_8)$alkoxy, $(C_1\text{-}C_8)$alkylthio, $(C_1\text{-}C_8)$alkylsulfinyl, $(C_1\text{-}C_8)$alkylsulfonyl, [$(C_1\text{-}C_8)$- alkyl]carbonyl, [$(C_1\text{-}C_8)$alkoxy]carbonyl, $(C_3\text{-}C_8)$cycloalkyl, phenyl and, in the case of cycloalkyl, also $(C_1\text{-}C_8)$alkyl, each of the last- mentioned 9 radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, $(C_1\text{-}C_4)$alkoxy, $(C_1\text{-}C_4)$alkylthio and, in the case of cyclic radicals, also $(C_1\text{-}C_4)$alkyl and $(C_1\text{-}C_4)$haloalkyl,

and

R^2,R^3 in each case independently of one another are hydrogen, amino, (C_1-C_6)alkyl, (C_1-C_4)alkylamino, di[(C_1-C_4)alkyl]amino, (C_1-C_4)alkyloxy, (C_3-C_6)cycloalkyl, [(C_1-C_4)alkyl]carbonyl, [(C_1-C_4)alkoxy]carbonyl, phenylcarbonyl, phenoxycarbonyl, (C_1-C_4)alkylsulfonyl, phenylsulfonyl or a saturated heterocyclyl radical having 3 to 6 ring atoms and 1 to 3 hetero ring atoms selected from the group consisting of N, O and S, where phenyl in the abovementioned radicals or the heterocyclyl radical independently of one another are unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)alkoxy, (C_1-C_4)alkyl, and (C_1-C_4)haloalkyl, or

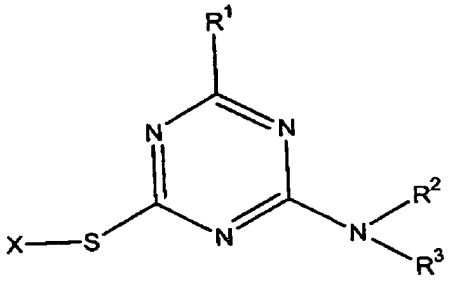
R^2,R^3 together with the nitrogen atom of the group NR^2R^3 is a saturated heterocyclic radical which has 3 to 6 ring atoms and 1 to 3 hetero ring atoms, where, in addition to the nitrogen atom, the other hetero ring atoms which may be present are selected from the group consisting of N, O and S and the heterocycle is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)alkoxy, (C_1-C_4)alkyl and (C_1-C_4)haloalkyl,

~~R^2,R^3 in each case independently of one another are hydrogen, amino, hydroxyl, formyl or unsubstituted (C_1-C_8)alkyl, (C_1-C_8)alkylamino, di[(C_1-C_8)alkyl]amino, (C_1-C_8)alkyloxy, aryl, aryloxy, (C_3-C_8)cycloalkyl, [(C_1-C_8)alkyl]carbonyl, [(C_1-C_8)alkoxy]carbonyl, arylcarbonyl, aryloxycarbonyl, (C_1-C_8)alkylsulfonyl, arylsulfonyl or an unsubstituted or substituted saturated heterocyclyl radical, heterocyclyloxy radical, heterocyclyamino radical, each of which has 3 to 6 ring atoms and 1 to 3 hetero ring atoms selected from the group consisting of N, O and S, or~~

~~R^2,R^3 together with the nitrogen from the group NR^2R^3 are a saturated heterocyclic radical having 3 to 6 ring atoms and 1 to 4 hetero ring atoms, where, in addition to the nitrogen atom, the other hetero ring atoms which may exist are selected from~~

~~the group consisting of N, O and S and the heterocycle is unsubstituted or substituted,~~

which comprises converting 2-amino-4-thio-1,3,5-triazines of the formula (II)



(II)

in which X represents (C_1-C_4)alkyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (C_1-C_4)alkoxy, (C_1-C_4)alkythio, (C_3-C_6)cycloalkyl and phenyl, each of the last-mentioned 4 radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (C_1-C_4)alkoxy, (C_1-C_4)alkylthio and, in the case of cyclic radicals, also (C_1-C_4)alkyl and (C_1-C_4)haloalkyl, or represents phenyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, cyano, nitro, (C_1-C_4)alkyl, (C_1-C_4)haloalkyl, (C_1-C_4)alkoxy, (C_1-C_4)haloalkoxy, (C_1-C_4)alkylthio and [(C_1-C_4)alkoxy]carbonyl, or represents a 2-amino-4-thio-1,3,5-triazine radical which is bonded via sulfur and equally substituted, ~~hydrogen, (C_1-C_6)alkyl, (C_2-C_6)alkenyl, (C_2-C_6)alkynyl or phenyl, where each of the last mentioned 4 radicals is unsubstituted or substituted, or represents a 2-amino-4-thio-1,3,5-triazine radical which is bonded via sulfur and equally substituted compared to the other triazine ring in the compound of formula I,~~

by chlorination in the presence of an essentially anhydrous protic solvent.

Claim 2 (cancelled)

Claim 3 (currently amended)

3. The process as claimed in claim 1, wherein,

R^1 is (C_1-C_6) alkyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, cyano, nitro, thiocyanato, formyl, (C_1-C_4)alkoxy, (C_1-C_4)alkylthio, (C_1-C_4)alkylsulfinyl, (C_1-C_4)alkylsulfonyl, [(C_1-C_4)alkyl]carbonyl, [(C_1-C_4)alkoxy]carbonyl, ~~(C_2-C_4)alkenyl, (C_2-C_4)alkynyl,~~ (C_3-C_6)cycloalkyl, phenyl, where each of the last-mentioned 8 ~~10~~ radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (C_1-C_4)alkoxy, (C_1-C_4)alkylthio and, in the case of cyclic radicals, also (C_1-C_4)alkyl and (C_1-C_4)haloalkyl,

or

(C_3-C_6)cycloalkyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, cyano, nitro, thiocyanato, formyl, (C_1-C_4)alkyl, (C_1-C_4)alkoxy, (C_1-C_4)alkylthio, (C_1-C_4)alkylsulfinyl, (C_1-C_4)alkylsulfonyl, [(C_1-C_4)alkyl]carbonyl, [(C_1-C_4)alkoxy]carbonyl, (C_2-C_4)alkenyl, (C_2-C_4)alkynyl, (C_3-C_6)cycloalkyl, phenyl, where each of the last-mentioned 11 radicals is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, (C_1-C_4)alkoxy, (C_1-C_4)alkylthio and, in the case of cyclic radicals, also (C_1-C_4)alkyl and (C_1-C_4)haloalkyl, and

R^2,R^3 in each case independently of one another are hydrogen, amino, (C_1-C_6)alkyl, (C_1-C_4)alkylamino, di[(C_1-C_4)alkyl]amino, (C_1-C_4)alkyloxy, (C_3-C_6)cycloalkyl, [(C_1-C_4)alkyl]carbonyl, [(C_1-C_4)alkoxy]carbonyl, phenylcarbonyl, phenoxycarbonyl, (C_1-C_4)alkylsulfonyl, phenylsulfonyl or a saturated heterocyclyl radical having 3 to 6 ring atoms and 1 to 3 hetero ring atoms selected from the group consisting of N, O and S, where phenyl in the abovementioned radicals or the heterocyclyl radical independently of one another are unsubstituted or substituted by one or more radicals selected from the group consisting

of halogen, hydroxyl, (C_1-C_4)alkoxy, (C_1-C_4)alkyl, and (C_1-C_4)haloalkyl, or

R^2,R^3 together with the nitrogen atom of the group NR^2R^3 is a saturated heterocyclic radical which has 3 to 6 ring atoms and 1 to 3 hetero ring atoms, where, in addition to the nitrogen atom, the other hetero ring atoms which may be present are selected from the group consisting of N, O and S and the heterocycle is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, (C_1-C_4)alkoxy, (C_1-C_4)alkyl and (C_1-C_4)haloalkyl.

Claim 4 (previously presented)

4. The process as claimed in claim 1, wherein a chlorinating agent selected from the group consisting of chlorine, salts of hypochlorous acid, phosphorus pentachloride, phosphoryl chloride and thionyl chloride is employed.

Claim 5 (previously presented)

5. The process as claimed in claim 1, wherein the chlorinating agent is employed in an amount of 1 to 100 equivalents based on the compound of the formula (II).

Claim 6 (previously presented)

6. The process as claimed in claim 1, which is carried out in the presence of an aprotic or essentially anhydrous protic solvent or mixtures of these.

Claim 7 (previously presented)

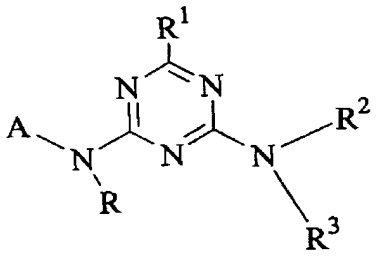
7. The process as claimed in claim 6 which is carried out at temperatures between -40°C and the boiling point of the solvent or mixtures of solvents employed.

Claim 8 (previously presented)

8. The process as claimed in claim 1, which is carried out at temperatures between 0°C and 50°C.

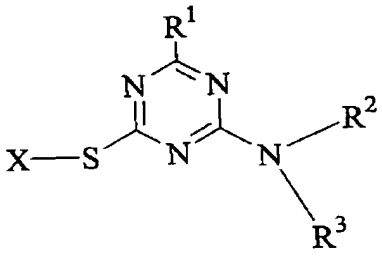
Claim 9 (previously presented)

9. A process for the preparation of a herbicidal aminotriazine of the formula (IV) or a salt thereof:



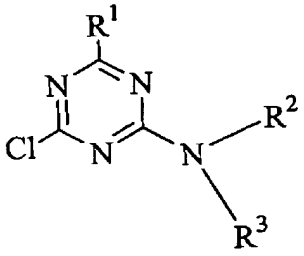
(IV)

which comprises chlorinating a 2-amino-4-thio-1,3,5-triazine of the formula (II):



(II)

to give a compound of the formula (I):



(I)

and reacting the resulting compound of the formula (I) with an amine of the formula (III):

A-NH-R (III)

to give the herbicidal aminotriazine of the formula (IV), where in formulae (I), (II), (III) and (IV), the radicals R^1, R^2, R^3 and X are as defined in claim 1 and A and R are organic radicals which in conjunction with the residual molecular structure of the formula (IV) constitute the chemical structure of a herbicidally active aminotriazine.

Claim 10 (previously presented)

10. The process as claimed in claim 9, wherein A is a (C_1-C_6)alkylene chain which is substituted in the α-position relative to the amino group by an unsubstituted or substituted alkyl radical and in the ω-position by an optionally substituted aryl, heteroaryl, aryloxy or heteroaryloxy radical and which is further unsubstituted or substituted further with substituents selected from the group consisting of halogen, alkyl, alkoxy and hydroxyl, and R is hydrogen or alkyl.

Claim 11 (cancelled)

Claim 12 (currently amended)

12. The process as claimed in claim 1, wherein said essentially anhydrous protic solvent is a carboxylic acid.

Claim 13 (currently amended)

13. The process as claimed in claim 1, wherein said essentially anhydrous protic solvent is selected from the group consisting of formic acid, acetic acid, n-propionic acid, n-butanoic acid and isobutanoic acid.

Claim 14 (currently amended)

14. The process as claimed in claim 1, wherein said essentially anhydrous protic solvent is glacial acetic acid.

Claim 15 (currently amended)

15. The process as claimed in claim 1, wherein X is $(C_1$-$C_4)$alkyl.

Claim 16 (new)

16. The process as claimed in claim 1, wherein R^1 is $(C_1$-$C_6)$alkyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxy, methoxy, ethoxy and cyclopropyl.

Claim 17 (new)

17. The process as claimed in claim 1, wherein R^1 is $(C_3$-$C_6)$cycloalkyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, $(C_1$-$C_4)$alkoxy, $(C_1$-$C_4)$alkyl and $(C_1$-$C_4)$haloalkyl.

Claim 18 (new)

18. The process of claim 1, wherein X is $(C_1$-$C_4)$alkyl, benzyl or phenyl, where each of the last-mentioned two groups is unsubstituted in the phenyl moiety or substituted by one or more radicals selected from the group consisting of halogen, cyano, nitro, $(C_1$-$C_4)$alkyl, $(C_1$-$C_4)$haloalkyl, $(C_1$-$C_4)$alkoxy, $(C_1$-$C_4)$haloalkoxy and $(C_1$-$C_4)$alkylthio.

Claim 19 (new)

19. The process as claimed in claim 1, wherein:

R^1 is $(C_1$-$C_6)$alkyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxy, methoxy, ethoxy and cyclopropyl; or

R^1 is $(C_3$-$C_6)$cycloalkyl which is unsubstituted or substituted by one or more radicals selected from the group consisting of halogen, hydroxyl, $(C_1$-$C_4)$alkoxy, $(C_1$-$C_4)$alkyl and $(C_1$-$C_4)$haloalkyl;

X is (C_1-C_4)alkyl, benzyl or phenyl, where each of the last-mentioned two groups is unsubstituted in the phenyl moiety or substituted by one or more radicals selected from the group consisting of halogen, cyano, nitro, (C_1-C_4)alkyl, (C_1-C_4)haloalkyl, (C_1-C_4)alkoxy, (C_1-C_4)haloalkoxy and (C_1-C_4)alkylthio;

the chlorinating agent is selected from the group consisting of chlorine, salts of hypochlorous acid, phosphorus pentachloride, phosphoryl chloride and thionyl chloride, wherein the chlorinating agent is employed in an amount of 1 to 100 equivalents based on the compound of formula (II); and

the essentially anhydrous protic solvent is a carboxylic acid.

Claim 20 (new)

20. The process as claimed in claim 19, wherein R^2 and R^3 are in each case independently of one another are hydrogen, acetyl, amino or methyl.